Topical levofloxacin, nepafenac and prednisolone acetate medication after cataract surgery in the biggest tertiary eye hospital in Finland during 2015-2018

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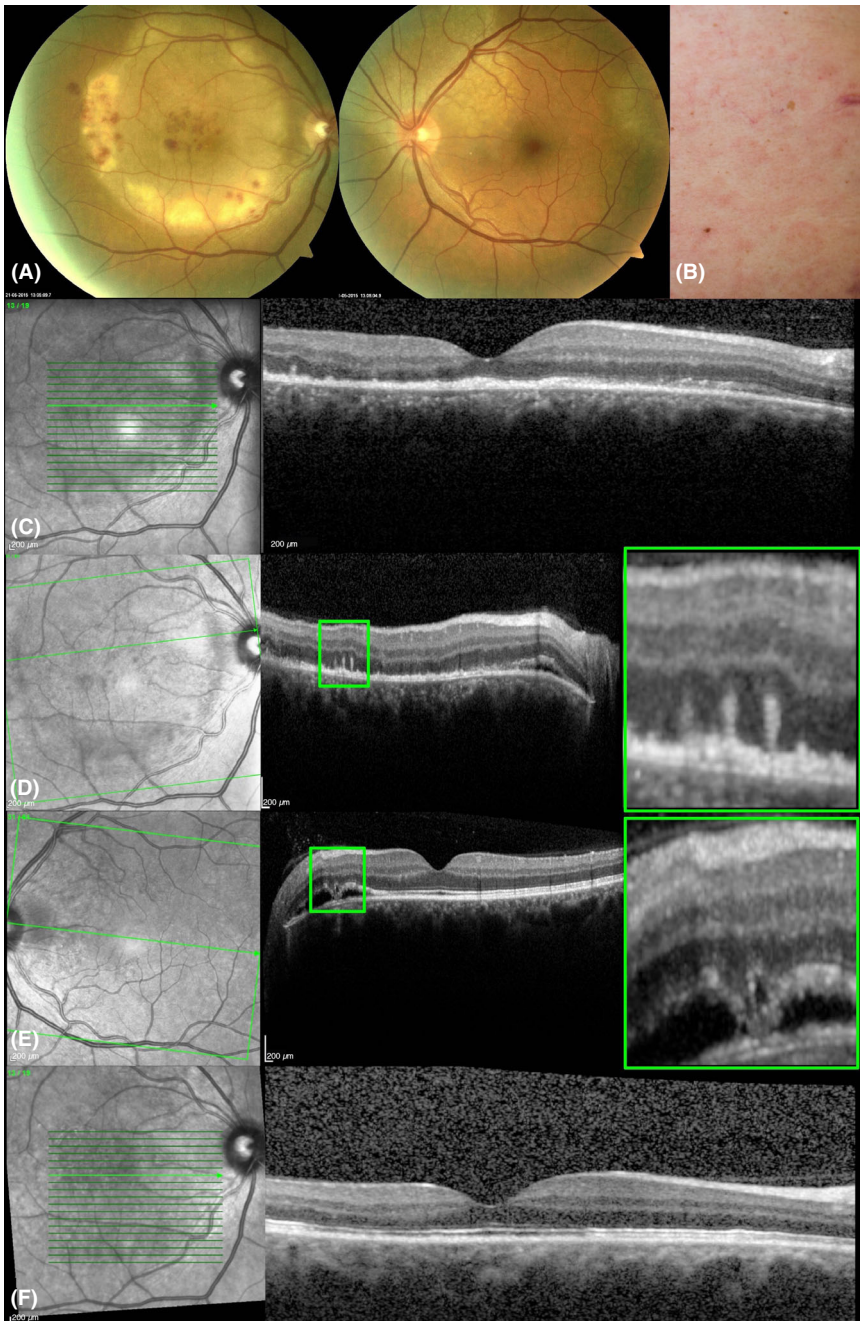

Fig. 1. (A) Fundus photography of the macular placoid lesion in the right and left eye. (B) Truncal maculopapular cutaneous erythema at presentation. (C) SD-OCT image of the macula in the right eye on presentation. Disruption of the outer segment structures with grainy, linear hyperdensities and lack of external limiting membrane at presentation. (D) The 'pitchfork sign' (green rectangle, insert) in the right eye. (E) Serous retinal detachment and membrane-like, hyperreflective subretinal lesion (green rectangle, insert) in the left eye. (F) Seven months after presentation, the outer retinal segment appeared normal in the fovea in the right eye.

Eventually, prompt targeted antibiotic therapy resulted in reconstitution of the outer retinal anatomic landmarks on SD-OCT.

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Topical levofloxacin, nepafenac and prednisolone acetate medication after cataract surgery in the biggest tertiary eye hospital in Finland during 2015–2018

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Dear Editor,

No general consensus exists regarding the best topical treatment practice after cataract surgery (CS) (Aptel et al. 2017; Juthani et al. 2017). Since no established guidelines are available, practice patterns throughout the world differ. Treatment protocol with topical nonsteroidal anti-inflammatory drugs (NSAIDs) after CS began decades ago (Miyake 1977). Today, NSAIDs such as ketorolac, nepafenac, diclofenac and bromfenac can be used to treat the postoperative

anterior chamber inflammation after CS combined to corticosteroids or as monotherapy.

Our institutional topical treatment regimen was revised in 2014 after topical NSAIDs had shown to offer efficacy comparable to steroids in reducing postoperative inflammation, but with a lower risk for adverse events (Kessel et al. 2014). Using a standardized, computerized platform for patients undergoing CS, we found that during 2015–2018, 60% of the eyes undergoing CS were treated with combination of topical levofloxacin and nepafenac, while 20.3% of eyes were treated with topical levofloxacin and prednisolone acetate (PA; Table 1). Triple combination treatment with topical levofloxacin, nepafenac and PA was used in <10% of our study eyes. Noteworthy, topical PA played an important role, especially in eyes with the most advanced cataract, in the eyes with lowest preoperative visual acuity, and in the eyes with intraoperative complication. Based on our study, we could see seasonal/yearly fluctuation in the use of the most commonly used topical drugs and their combinations in our institution. There was a trend of increased use of topical PA during the study period reflecting partially the instinctive experience of the surgeons to diagnose more inflammatory reaction and cells in the anterior chamber of our patients using nepafenac instead of PA (Grzybowski & Kim 2016). Part of the yearly quartile variation was explained by the fact that nepafenac was temporarily out of stock during the last quartile of the year 2018.

We do acknowledge the following limitations. Our study is retrospective with some inaccuracies in data coding such as missing data. Of note, we could neither assess the postoperative functional visual or refraction outcomes in our study eyes nor patient-reported outcome measures. Neither patient-reported tolerability issues of prescribed medication could be studied (Hovanesian & Holland 2019). In the future, National Cataract Registry and Co-ordination will be highly required in Finland including preoperative risk calculation at least to combination ocular surgeries (Goltz et al. 2018).

Herein, incidence of endophthalmitis was 0.0045%. In 95% of the eyes, we used intracameral cefuroxime shown to be 100% effective in preventing endophthalmitis (Jabbarvand et al. 2016). In

Table 1. Summary of surgical characteristics and actual topical treatment in a large adult cataract surgery cohort operated during 2015–2018.

Basic data of operated eyes	
Operated eyes/patients (*n*)	21 962/15 994
Female/male	63/37%
ICD-code	
H25.1 normal cataract	20 007 (91.1%)
H26.02 presenile cataract	0.3%
H26.1 traumatic cataract	0.07%
H26.2 related to other eye disease	7.2%
Related to other ICD category	1.3%
Preop risk stratification i.e. estimated severity of cataract	
Green category/yellow/red	37.7/56.3/6.0 (%)
Mode of anaesthesia	
Topical	20 864 (95%)
Peribulbar/general	1098 (5%)
Single/bilateral eye surgery	20 886 (95.1%)/ 1076 (4.9%)
Anterior chamber Xylocain + PHNL	1855 (8.4%)
Viscoelastic agent	
Discovisc/Viscoat/other	85.8/11.9/2.3 (%)
Trypan blue staining	1059 (4.8%)
Characteristics of anterior segment	
Small pupil	3601 (16.4%)
Exfoliation syndrome+	2174 (9.9%)
Need of pupil expansion device	1405 (6.4%)
Malyugin ring/hook	5.9%/0.5%
Phaco technique	
Stop-chop	9595 (43.7%)
Divide-conquer	8731 (35.8%)
Chop	3278 (14.9%)
Other	355 (1.6%)
Location of inserted IOL	
Posterior chamber	21 304 (97%)
Sulcus fixated	69 (0.3%)
Anterior chamber	24 (0.1%)
Missing info	565 (2.6%)
Intracameral antibiotic 0.1 ml	
Cefuroxime 10 mg/ml	20 832 (94.8%)
Vancomycin 10 mg/ml	352 (1.6%)
Moxifloxacin	54 (0.2%)
Not known	724 (3.3%)
Nylon suture (10-0) to the main wound	219 (1%)
Target refraction	
Emmetropic	18 008 (82%)
−2 to −2.5 D	2525 (11.5%)
Other/missing	4.0%/2.5%
Duration of surgery	
<10 min	1207 (5.5%)
11–15 min	6281 (28.6%)
16–20 min	6083 (27.7%)
>20 min	8367 (38.1%)
Topical medication	
Levofloxacin 5 mg/ml + nepafenac 3 mg/ml	13 349 (60.8%)
Levofloxacin 5 mg/ml + PA 10 mg/ml	4468 (20.3%)
Levofloxacin 5 mg/ml + nepafenac 3 mg/ml + PA 10 mg/ml	1715 (7.8%)
Other, including glaucoma medication	2430 (11.1%)

Use of topical nepafenac and PA in various subgroups		
Preop visual acuity (VA)	VA given in 14 792 eyes (67.4%)	Use of PA and/or N
<0.1 on AR	1814 (12.3%)	33.1% used PA + 74.2% used N
0.1–0.5 on AR	11 822 (79.9%)	26.0% used PA + 73.5% used N
>0.5 on AR	1156 (7.8%)	22.7% used PA + 77.3% used N
Risk stratification i.e. Severity of cataract		
Green category (normal)		21.4% of eyes used PA
Yellow (moderate)		28.7% of eyes used PA
Red (advanced)		37% of eyes used PA

Table 1. (Continued)

Intraoperative complications in the whole cohort	400 (1.8%)	
Anterior capsule tear	87 (21.8%)	42.5% used PA + 55.2% used N
Iris damage	118 (29.5%)	47.5% used PA + 59.3% used N
Posterior capsule rupture	110 (27.5%)	48.25 used PA + 59.1% used N
Dropped nucleus	16 (4%)	56.3% used PA + 75% used N
Other	69 (17.2%)	
Changes in PA use during 2015–2018	Operated eyes (*n*)	Used medication
3rd quartile of the year 2015	903	9% used PA + 75.2% used N
3rd quartile of the year 2016	852	14.3% used PA + 92.7% used N
3rd quartile of the year 2017	994	22.4% used PA + 89.0% used N
3rd quartile of the year 2018	1395	36.3% used PA + 83.1% used N
Postoperative endophthalmitis during 2015–2018		
Propionibacterium acnes	1 eye (0.0045%)	

The eyes with cataract were coded with International Classification of Disease (ICD)-codes. Surgical risk stratification of operated eyes was as follows: normal cataract (green; nuclear sclerosis ++), moderate cataract (yellow; nuclear sclerosis +++) and advanced cataract (red; no red reflex, loose zonules, exfoliation ++, VA < 0.1). The surgical technique was the standard minimally invasive phacoemulsification technique (Infinity/Centurion Vision System, Alcon Laboratories, Inc., Fort Worth, TX, USA) with a 2.4–2.75 mm clear corneal incision. In the uncomplicated cataract surgeries, single-piece acrylic monofocal IOL (AMO Tecnis®, Johnson & Johnson Surgical Vision Inc., Santa Ana, CA, USA) or three-piece aspheric acrylic IOL (Tecnis® ZA9003, Abbott Medical Optics Inc, Santa Ana, CA, USA) was folded and inserted using a lens injector to the capsular bag (posterior chamber IOL). Data were collected from the operating room management system consisting of all cataract operations in the BCB Medical cataract database (BCB cataract database, Turku, Finland) between 1 January 2015 and 31 December 2018. The study represents secondary use of registered surgical data and is without patient contact. AR = autorefractometer, IOL = intraocular lens, N = nepafenac, PA = prednisolone acetate, PHNL = phenylephrine 10%, VA = visual acuity.

previous studies, our mainline strategy to use intracameral cefuroxime together with topical levofloxacin has been shown to lower the chance of endophthalmitis with high-to-moderate quality evidence (Kessel et al. 2015; Gower et al. 2017). We use intracameral antibiotics despite their potential risks and their role being controversial in prophylaxis of endophthalmitis post-CS (Çakır et al. 2015; Witkin et al. 2015; Schwartz et al. 2016). Regimen of topical antibiotic use deserves to be revised next, since resistance issues are an ever-increasing problem globally.

Even though our hospital registry data allow a tool for understanding current clinical practice patterns in our high-volume CS unit, more thorough prospective clinical studies are still needed to answer various specific questions related to ophthalmic outcome parameters (such as final visual function, vision-related quality of life, occurrence of postoperative cystic macular oedema, intraocular lens (IOL) dislocation/tilt, results of combinatorial/post-vitrectomy cataracts surgeries), and issues related to each specific topical therapy. In the future, the structural data should be linked with systemic medication and type of IOL used. We hope that the actual use of very structured data could, however, stimulate and set standards for other ophthalmic departments.

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